

CLAIMS

What is claimed is:

1. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, and a receiver means for receiving said predetermined signal and providing a security response, said movement detecting and signal transmitting means comprising an inertial sensor.
2. The system of claim 1 wherein said movement detecting and signal transmitting means comprises a gyroscope sensor.
3. The system of claim 1 wherein said movement detecting and signal transmitting means comprises a MEMS accelerometer sensor.
4. The system of claim 1 wherein said movement detecting and signal transmitting means comprises a piezo film accelerometer sensor.
5. The system of claim 2 wherein said movement detecting and signal transmitting means comprises an accelerometer sensor with a piezoelectric audio transducer construction that includes a piezoelectric element mounted to a diaphragm, said sensor further including a mass attached to said diaphragm.
6. The system of claim 5 wherein said mass is one of a quantity of adhesive, a quantity of solder, or a solid object bonded to said diaphragm.
7. The system of claim 1 wherein said movement detecting and signal transmitting means comprises an accelerometer sensor with a piezoelectric audio transducer construction that includes a piezoelectric element mounted to a diaphragm, and with said piezoelectric element and said diaphragm being disposed within a partial vacuum environment.

8. The system of claim 7 wherein partial vacuum environment is provided by an airtight compartment.
9. The system of claim 8 wherein said airtight compartment is a vacuum sealed enclosure.
10. The system of claim 1 wherein said movement detecting and signal transmitting means further comprises a magnetic field sensor.
11. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement of an object and wirelessly transmitting a first predetermined signal indicating movement of said object, environmental monitor means for sensing an environmental condition and wirelessly transmitting a second predetermined signal indicating said environmental condition, and a receiver means for receiving said first and second predetermined signals and providing a security response.
12. A system in accordance with claim 11 wherein said environmental monitor is separate from said movement detecting and signal transmitting means.
13. A system in accordance with claim 11 wherein said environmental condition includes one or more of temperature, smoke level, carbon monoxide level, and hydrocarbon level.
14. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, a receiver means for receiving said predetermined signal and providing a security response, and a remote speaker system adapted to receive wireless signals from said receiver means.

15. The system of claim 14 wherein said speaker system stores plural audio files.
16. The system of claim 14 wherein said speaker system is adapted to receive a wireless signal from said receiver means specifying one of said audio files and a security state code that specifies a manner in which the specified audio file is to be output.
17. The system of claim 14 wherein said speaker system has a unique identifier that said receiver means uses to communicate with said speaker system and to distinguish said speaker system from other speaker systems of like construction.
18. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement of an object and wirelessly transmitting a predetermined signal indicating movement of said object, a receiver means for receiving said predetermined signal and providing a security response, and a remote control unit comprising a first switch for setting said receiver means into a hold state, a second switch for setting said receiver means into an away state, and third switch for setting said receiver means into a panic state.
19. The system of claim 18 wherein said receiver means is adapted to respond to activation of said first switch by disarming itself from producing a security response for a predetermined period, said predetermined period being selectable based on a manner in which said first switch is activated.
20. The system of claim 18 wherein said receiver means is adapted to arm itself for providing a security response when said second switch is activated.
21. A portable security alarm system for detecting a security condition and providing information relative thereto, said system comprising plural triggers for

detecting said security condition and wirelessly transmitting a predetermined signal indicating said condition, and a receiver means for receiving said predetermined signal and providing a security response, said predetermined signal further including a unique identifier identifying said trigger and a status code providing information about a condition associated with said trigger.

22. The system of claim 21 wherein said status code provides information about a condition external to said trigger.

23. The system of claim 21 wherein said status code provides information about a condition internal to said trigger.

24. The system of claim 21 wherein said receiver means is adapted to maintain attribute information so that following receipt of said predetermined signal containing one of said status codes from one of said triggers, subsequent predetermined signals containing the same status code from the same trigger will be ignored until processing of the first predetermined signal is complete, but subsequent predetermined signals from the same trigger containing different status codes, and predetermined signals from other triggers, will be processed.

25. The system of claim 21 wherein said receiver means is adapted to associate each of said triggers with an assigned security state when said receiver means is in a home state, said security state being used to produce said security response when one of said triggers transmits said predetermined signal.

26. The system of claim 25 wherein said receiver means is adapted to override said default security states when said receiver means is in an away state.

27. The system of claim 21 wherein said receiver means includes a home state, an away state, and a panic state.

28. The system of claim 21 wherein said receiver means includes a quiet mode in which said security response produces fewer audible alarms than when said receiver means is not in said quiet mode.

29. The system of claim 21 wherein said receiver means is adapted to store word codes in association with said triggers that identify objects to which said triggers are mounted.

30. The system of claim 21 further including a remote control unit for controlling said receiver means and wherein said triggers are movement detecting and signal transmitting means for detecting movement of objects, said remote control units and said movement detecting and signal transmitting means each being assigned one of a restricted designation or an unrestricted designation, and said receiver means being adapted to prevent a restricted control unit from disarming said system relative to a restricted movement detecting and signal transmitting means, while allowing an unrestricted control unit to disarm said system relative to any of said movement detecting and signal transmitting means.

31. A security network comprising a security administration system and at least one portable security alarm system, said security administration system comprising a computer host programmed to respond to security alerts, a communication interface, and a data storage resource containing provisioned information for subscribers using said portable security alarm systems, said portable security alarm system comprising plural triggers adapted to detect a security condition and provide an indication thereof including a unique trigger identifier and a status code to a base station in wireless communication with said triggers, said base station storing word codes that identify objects to which said triggers are mounted and being adapted to implement a security response to a condition being sensed by any of said triggers, said security response including transmission of a base station identifier associated with said base station and a trigger identifier, a status code and a word code associated with one of said triggers to said security administration system.

32. The security network of claim 31 wherein said subscriber information provisioned by said security administration system includes contact information for each trigger of each of said portable security alarm systems, and wherein a security notification is made based on said contact information following receipt of said transmission from said base station.

33. The security network of claim 32 wherein said contact information includes contact information for plural security notification recipients, and wherein said security notification includes attempting contact of each recipient in sequence until one of said recipients responds.

34. The security network of claim 32 wherein said contact information includes contact information for plural security notification recipients, for plural languages, and wherein said security notification includes attempting contact of each recipient simultaneously.

35. The security network of claim 32 wherein said contact information includes contact information for plural security notification recipients, and wherein said security notification includes setting up a conference call among said recipients.

36. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, and a receiver means for receiving said predetermined signal and providing a security response, said movement detecting and signal transmitting means being adapted to respond to movement of said object without said object having to be in a reference position prior to said movement.

37. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a

movement detecting and signal transmitting means for detecting movement of an object and wirelessly transmitting a predetermined signal indicating movement of said object, a receiver means for receiving said predetermined signal and providing a security response, and a remote control unit comprising a radio frequency identification circuit adapted to provide remote control unit identification information to said movement detecting and signal transmitting means, and said movement detecting and signal transmitting means being adapted to provide said remote control unit identification information along with said predetermined signal to said receiver means.

38. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, and a receiver means for receiving said predetermined signal and providing a security response, said receiver means having a video output.

39. A security network comprising a security administration system and at least one portable security alarm system having a wireless receiver means and one or more wireless movement detecting and signal transmitting means for transmitting security information to said receiver means, said security administration system comprising a computer host programmed to respond to security alerts from said at least one portable security alarm system, and being further programmed to provide information to said at least one portable security alarm system, said information including one of security alert notifications from a governmental agency, advertising or other commercial information.

40. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, and a receiver means for receiving said predetermined signal and providing a security response, said movement detecting and signal transmitting means comprising an inertial sensor that

includes a piezoelectric element mounted to a flexible diaphragm, and a mass on one of said piezoelectric element and said diaphragm.

41. The system of claim 40 wherein said mass is secured to said piezoelectric element or said diaphragm by way of a coupling connection that introduces a desired strain in said piezoelectric element through flexing of said diaphragm as said sensor is accelerated in a direction generally orthogonal to a principal plane of said diaphragm.

42. The system of claim 40 wherein said mass is secured to said piezoelectric element or said diaphragm by way of a coupling connection that is sized to introduce a desired strain in said piezoelectric element through a cantilever coupling moment as said sensor is accelerated in a direction generally parallel to a principal plane of said diaphragm.

43. The system of claim 40 wherein said mass is unstable.

44. The system of claim 40 wherein said mass is unstable and unbalanced.

45. The system of claim 44 wherein said mass comprises a primary mass element that is attached to one of said piezoelectric element and said diaphragm, and a secondary mass element on said primary mass element.

46. The system of claim 45 wherein said primary mass element is larger than said secondary mass element.

47. The system of claim 45 wherein one or both of said primary mass and said secondary mass are generally spherical in shape.

48. The system of claim 45 wherein said secondary mass element is on said primary mass element at a location that is offset from a line extending through said piezoelectric element and a center of gravity of said primary mass element.

49. The system of claim 40 wherein said inertial sensor comprises a piezoelectric audio transducer having said mass secured thereto.

50. The system of claim 40 wherein said inertial sensor comprises a support ring housing to which said diaphragm is mounted and which facilitates free-flexing of said diaphragm.

51. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, and a receiver means for receiving said predetermined signal and providing a security response, said movement detecting and signal transmitting means comprising an inertial sensor that includes a piezoelectric element mounted to a diaphragm, and a mass on one of said piezoelectric element and said diaphragm, said sensor further including a main housing carrying said inertial sensor, a circuit board, a battery and means for affixing said movement detecting and signal transmitting means to said object.

52. The system of claim 51 wherein said diaphragm is mounted to a ring housing that is attached via clips to said circuit board.

53. The system of claim 51 wherein said means for affixing comprises adhesive.

54. A portable security alarm kit for detecting the movement of an object and providing information relative to said movement, said kit comprising a portable carrying case, plural movement detecting and signal transmitting means situated in said case for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, a receiver means situated in said case for receiving said predetermined signal and providing a security response, and a remote control unit situated in said case for controlling said receiver means.

55. An inertial sensor comprising a piezoelectric element mounted to a flexible diaphragm, and a mass on one of said piezoelectric element and said diaphragm.

56. The sensor of claim 55 said mass is secured to said piezoelectric element or said diaphragm by way of a coupling connection that introduces a desired strain in said piezoelectric element through flexing of said diaphragm as said sensor is accelerated in a direction generally orthogonal to a principal plane of said diaphragm.

57. The sensor of claim 55 wherein said mass is secured to said piezoelectric element or said diaphragm by way of a coupling connection that is sized to introduce a desired strain in said piezoelectric element through a cantilever coupling moment as said sensor is accelerated in a direction generally parallel to a principal plane of said diaphragm.

58. The sensor of claim 55 wherein said mass is unstable.

59. The sensor of claim 55 wherein said mass is unstable and unbalanced.

60. The sensor of claim 59 wherein said mass comprises a primary mass element that is attached to one of said piezoelectric element and said diaphragm, and a secondary mass element on said primary mass element.

61. The sensor of claim 60 wherein said primary mass element is larger than said secondary mass element.

62. The sensor of claim 60 wherein one or both of said primary mass and said secondary mass are generally spherical in shape.

63. The sensor of claim 60 wherein said secondary mass element is on said primary mass element at a location that is offset from a line extending through said piezoelectric element and a center of gravity of said primary mass element.

64. The sensor of claim 55 wherein said sensor comprises a piezoelectric audio transducer having said mass secured thereto.
65. The sensor of claim 55 wherein said sensor comprises a support ring housing to which said diaphragm is mounted and which facilitates free-flexing of said diaphragm.
66. The sensor of claim 55 in combination with a device that is activated or deactivated by said sensor.
67. A portable security alarm system for detecting the movement of an object and providing information relative to said movement, said system comprising a movement detecting and signal transmitting means for detecting movement an object and wirelessly transmitting a predetermined signal indicating movement of said object, and a receiver means for receiving said predetermined signal and providing a security response, said movement detecting and signal transmitting means comprising a long wave motion sensor, a vibration sensor and control circuitry for distinguishing between a vibration event and a long-wave motion event.